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"On some peculiar modifications of the Force of Cohesion, with reference to the forms and structure of Clouds, Films and Membranes." By William Addison, Esq., F.L.S. Communicated by P. M. Roget, M.D., Sec. R.S.

In the course of his researches into the nature and origin of tubercles in the lungs, and into the physical properties of the secretions of the human structure, the author had occasion to notice various fibrous and membranous forms arising solely from physical agencies. On pursuing the inquiry, he observed a class of phenomena indicating some peculiar modifications of the force of cohesion. Thus he found that transparent liquid streams are visible when vapours or fluids mingle with one another, and also when solids are dissolving in a fluid; and that opaque deposits, assuming the appearance of clouds, form on those streams, rendering visible the lines of junction of two fluid or gaseous surfaces. A great number of experiments are described illustrating these general facts, which are afterwards applied to explain various phenomena of clouds, films and membranous formations, resulting from the operation of the different cohesive forces which are called into action, under a diversity of circumstances, when liquid or gaseous bodies are brought into mutual contact.

"On the formation or secretion of Alkaline and Earthy Bodies by Animals." By Robert Rigg, Esq., F.R.S.

From the results of a comparison made by the author of the weight of the ashes obtained from a quantity of bread, equal to that which was the sole food of two mice during thirty-eight days, with the weight of the ashes of their excretions during the same period, it appeared that the latter exceeded the former in the proportion of 1334 to 934. The amount of soluble salts was also found to be greater in the latter than in the former. From these data, the author infers that both alkaline and earthy bodies are formed out of their elements by the animal system, and found in their excretions.

"An Account of the Observation of the total Eclipse of the Sun on the 21st of December 1843." By Lieutenant J. O. E. Ludlow, E.I.C. Engineers, Superintendent of the Magnetic Observatory at Madras. Communicated by J. C. Melville, Esq., F.R.S., Secretary to the Hon. the Court of Directors of the East India Company.

The author reports the results of his observation of the eclipse, which was unfortunately much interrupted by the passage of clouds; and he has also taken the opportunity of making observations on the Magnetic Dip and Horizontal Intensity at certain places on his journey.

"On the Barometrical Variation as affected by the Moon's Declination." By Luke Howard, Esq., F.R.S.

In this paper, which is a continuation of that which was published in the Society's Transactions for 1841 (p. 277), and in which the

average results of the author's observations extended only from the year 1815 to 1832, similar records of calculated averages are given down to the year 1841, and a comparison drawn with those of the former period. The author places the whole of these data in the hands of the Royal Society, for the purpose of being made the basis of future inquiry, in what he terms "the nascent science of Meteorology."

"Contributions to the Chemistry of the Urine; on the variations in the Alkaline and Earthy Phosphates in the healthy state, and on the Alkalescence of the Urine from fixed Alkali." By Henry Bence Jones, M.A. Cantab., Licentiate of the Royal College of Physicians.

The author, having observed that in some states of disease there occurs in the urine a great excess of the earthy phosphates, was induced to investigate the subject; and as a preliminary inquiry, to ascertain the variations in the amount of these phosphates at different times in the same person in a state of health, and to trace the causes which determine an excess or a deficiency of these salts in the urine; noting, at the same time, the variations in the quantity of the alkaline phosphates contained in it, with a view of discovering whether these variations are influenced by the same, or by different causes. The principal results to which his experiments have conducted him are the following. The quantity of the earthy phosphates in the urine voided soon after taking food is considerably greater than in that voided at other times; and this happens whether the meal consists of animal food or of bread only. After long fasting, the proportion of earthy phosphates is considerably diminished. On the other hand, the alkaline phosphates are present in greatest quantity when the food consists of bread alone: when meat alone is taken, the deficiency in those salts is still more marked than the excess in the former case. Exercise occasions no change in the quantity of the earthy phosphates, but causes an increase of nearly one-third in the amount of alkaline phosphates; but its influence is, on the whole, less than that of diet. The earthy phosphates are increased in quantity by chloride of calcium, sulphate of magnesia, and calcined magnesia taken into the stomach.

The author next examines the conditions in which the urine is alkaline, and which he considers to be of two kinds; the one, long known as *ammoniacal*, and arising from the presence of carbonate of ammonia; and the other, which has not hitherto been distinctly recognised, arising from fixed alkali, and appearing most frequently in urine secreted during a period of from two to four hours after breakfast, in persons suffering only from defective digestion. Under these circumstances, it may be, when voided, either turbid from amorphous sediment, or clear and alkaline when tested, or free from deposit and slightly acid. If in either of these last cases it be heated, an amorphous precipitate falls down, which is soluble in dilute hydrochloric acid, or in a solution of biphosphate of soda. Healthy urine may at any time be made to yield a precipitate of earthy phosphates by heat, even though it be acid, by having a portion of this